With a recommendation for hazardous fuels reduction, a reduction in frequency and intensity of wildfire spreading from city or private property to public lands and a reduction in wildfires spreading from public lands to city and private property would be realized.

2.0 Description of Area:

Lincoln County is located in Southern Idaho in the northern portion of the Magic Valley with its county seat at Shoshone. It encompasses 771,000 acres in a rural type setting with the majority of populations centered around three (3) small communities; 1) Dietrich, 2) Richfield and the county seat at 3) Shoshone. Lincoln County is Idaho's sixteenth (16) largest county (land mass) in Idaho, with most lands divided among three (3) major landowners (Table 1). The county is relatively flat with some rolling hills and numerous escarpments associated with historical lava flows. Approximately 299,400 acres of Lincoln County are considered barren from historic volcanic activity.

Each of the three (3) primary communities within Lincoln County (Dietrich, Richfield and Shoshone) contain a tax base supported fire department and fire protection district (Figure 1). Early settlements such as Marley and Burmah and various labor camps, established along the UPRR, are no longer in existence or represent a very small community or cluster of homes.

2.1 Land status:

Lincoln County contains approximately 771,000 acres divided among three (3) major landowners. (Table 1) Figure 1 displays Lincoln County land ownership and the three (3) fire protection districts. All state and federal lands located within Lincoln County are protected through Mutual Aid Agreement with respective FPD.

Table 1. Land Status of Lincoln County, Idaho

Owner	Acres	Percent
State of Idaho	22,251	2.9
Private	164,100	21.3
BLM	582,912	75.83
***Other**	2,321	0.3

*Idaho Department Fish and Game, Bureau of Reclamation, Idaho Department of Parks and Recreation, County, Municipal

2.2 Population:

Presently, Lincoln County is experiencing a development boom, fueled by the increased demand for goods and services in Blaine County. Affordable housing costs in Lincoln County are attracting new homeowners who commute to the job market in the north. Each of the three (3) communities within Lincoln County has experienced an increase in subdivision development and new housing starts, as have the unincorporated portions of the county. Lincoln County has grown by 2.176% over the past three (3) years.

Population density for the county is 3.4 persons per square mile. According to the mid 2000-2003 census report, Lincoln County now has 4,132 people, 1,651 households and 1,050 families residing in the county. That population is equally divided between the three cities and the unincorporated portions of the county. (Table 2)

Table 2. Population of major communities in Lincoln County, Idaho

Major Cities – Lincoln County, Idaho	2000 Population Census	2003 Population Census
Dietrich	159	167
Richfield	429	451
Shoshone	1488	1565
Unincorporated Population	1968	1949
Total County Population	**4044**	**4132**

2.3 Agriculture:

Agriculture is limited due to extensive lava outcrops. Crops include wheat, corn, alfalfa, potatoes, sugar beets, and dairy and range cattle. Livestock grazing on BLM lands, combined with increased wildfires, has led to the conversion of sage-steppe shrub to crested wheat and cheat- grass, increasing the wildfire return interval due to the early flammability and rapid invasion of cheatgrass.

The rural development of agriculture has determined the way the county developed. Irrigation systems used in agriculture served to break up the wild lands and created a different fuel complex with a unique fire risk. More recently the conversion of productive lands to urban development represents one of the greatest fire risks in the county. Previously irrigated croplands are idled and allowed to go to weeds. Water transfers away from productive lands and assures the short-term growth of weeds and fuels. As new subdivisions develop, new landowners fail to control the weed and grass growth on the small (5-20 acres) mini ranchettes.

2.4 Climate:

Warm dry summers and cold to very cold winters characterize Lincoln County. The majority of precipitation occurs from November to March. Temperatures may exceed 100 degrees during July and August, and have been recorded as low as –30 degrees during the winter months. The average frost-free period is 112 days.

Summer may begin with a sudden change to warm and dry weather around the first of June during the day, but chilly nights may persist into July. Showers and thunderstorms are common. Afternoon temperatures occasionally rise into the low 90's, but nighttime temperatures are usually in the 50's. The fall brings cooler weather with daytime temperature rarely exceeding the 70's and dipping into the 40's by mid November, but remaining dry.

The Bureau of Land Management (BLM) collects and analyses historical fire weather to determine local burning conditions. Modeling for burning conditions are based up the fifty (50) percentile, which represents normal conditions; the ninety (90) percentile which represents drought conditions, and in recent drought related years the ninety-seventh (97) percentile which represents severe drought conditions.

The analysis of drought related conditions directly relate to burning conditions and provide a realistic picture of predicted fire behavior which firefighters may anticipate whenever a wildfire occurs. Presently, the combination of below average precipitation and high summer temperatures increase the annual fire cycle and ignition opportunity.

With the continued drought Lincoln County is presently experiencing, drought conditions and the corresponding burning conditions are being modeled at the ninety-seventh (97) percentile for severe drought conditions. Therefore, when a wildfire does occur, Lincoln County emergency first responders will experience extreme fire behavior.

Table 3. Monthly Climate Summary for Lincoln County, Idaho for years 1978 to 2003

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
Ave. Max. Temperature (F)	34.7	41.6	51.7	54.9	66.7	76.8	85.9	83.8	74.6	61.8	45.9	36.8	62.32
Ave. Min. Temperature (F)	18.6	22.9	26.4	34.8	42.6	49.1	53.8	52.9	44.4	36.1	28.1	19.4	34.41
Ave. Total Precipitation (in.)	1.21	0.79	0.93	0.96	1.29	0.88	0.38	0.47	0.59	0.68	0.99	1.09	7.91
Ave. Total Snowfall (in.)	6.8	3.7	2.8	1.6	0.6	0.0	0.0	0.0	0.0	0.3	2.6	5.9	23.0
Average Snow Depth (in.)	3	2	0	0	0	0	0	0	0	0	0	2	2

2.5 Vegetation:

Common native vegetation found in Lincoln County include Wyoming big sagebrush (*Artemisia tridentate* spp. *Wyomingensis*), green rabbitrush (*Chrysothamnus vicidiflorus*), greasewood (*Sarcobatus vermiculatus*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Thurber's needlegrass (*Achnatherum thurberianum*), Sandberg bluegrass (*Poa secunda*), arrowleaf balsamroot (*Balsamorhiza sagittata*), and Indian ricegrass (*Achnatherum hymenoides*). Much of the rangeland is comprised of crested wheatgrass (*Agropyron cristatum*) seedings with halogeton (*Halogeton glameratus*) and cheatgrass (*Bromus tectorum*) dispersed along roadways and disturbed sites.

Due to frequent wildfire activity, livestock grazing and other disturbance, much of the rural areas in Lincoln County have been converted to crested wheatgrass seedings, where rehabilitation is feasible, and the invasive, exotic annual cheatgrass. The wildfire return interval has been shortened dramatically because of the early flammability and rapid rate of spread of cheatgrass.

2.6 Wildfire history/risk:

Historically, major industry within the county has centered along State Highway 75 and 93, the Union Pacific Railroad (UPRR), and the rural areas in close proximity to the three (3) primary communities.

The very rural aspect of the county has determined the way the county is presently developing. The irrigation systems used in agriculture areas have serviced to break up the wildland and human created fuels, and has created a different fuel complex with its unique potential fire problems.

With a heavy travel corridor running throughout the middle of the county, fire incidents are from both natural and human causes. The highest fire frequency has occurred in the extreme eastern portion of the county and for the most part, entirely on BLM lands.

Wildfire frequency in Lincoln County is high. The three (3) tax based Fire Protection Districts located in Lincoln County (Dietrich, Richfield, and Shoshone) respond to an average of twelve (12) brush fires annually and since 1975 have been involved with one hundred forty six (146) wildfires for a total of 277,065 acres lost.

The risk of wildfires within and adjacent to Lincoln County is high due in part to an accumulation of excess flammable fuels and land use changes over the past decade. Cool wet springs have increased grass and shrub density within the sagebrush-steppe and persistent drought has led to a high to extreme fire danger. Figure 2 shows fuel models and historical fire perimeters for years (1999-2002).

Since 1995, and the creation of Mutual Aid agreements with neighboring FPD's and Federal Agencies represented throughout southern Idaho, Lincoln County's three (3) FPD's have responded to an average of sixteen (16) wildfires annually; a 3.0% response increase over the past fifteen (15) years.

The three (3) year average (2001-2003) of all emergency responses or call outs made by Lincoln County's three (3) FPD's displays an upward trend. (2001 – 2002 twenty seven (27) average annual responses, 2002 20033, forty three (43) average annual responses. This annual response increase represents a 5.3 percent increase in emergency responses over the past three (3) years.

Table 4 Lincoln County Fire History from 1994 to 2004

YEAR	FIRE	ACRES	YEAR	FIRE	ACRES
1994	KINZIE BUTTE	10.0	1997	CAMP ONE	10
"	KERNER	10.0	"	BP148ESCP	500
"	HY-24-MP-35N	10.0	1997	Total: 11 Fires For	696 ac
1994	Total: 3 Fires For	30.0 Ac.	1998	2W4 MILLARD	50
1995	**RIVERWOOD**	5	"	**PAGARI NW**	40
"	**HY-93-MP-17**	10	"	BAT CALL	10
"	STAR LAKE	10	"	**BURMA HNO**	50
"	CAMP ONE	10	"	**BURMA HNO2**	10
"	UPRR-MP-319	1	"	**MARLEY RD**	1
"	**DIETRICH BUTTE**	10	"	HIDDEN VALLEY	100
"	ROCK LAKE	2180	1998	Total: 7 Fires For	261 ac
"	**UPRR-MP-328N**	20	1999	RICHFIELD CANAL	1
"	TUNUPA	5	"	RICHFIELD CANAL	1
"	UPRR-MP-30425	10	"	DISPATCH	10
"	UPRR-MP-307N	10	"	UPRR MP307	10
"	KIMAMA	50	"	PREACHER CREEK	1
"	SID	1	"	**SHOSHONE W**	900
"	LAIDLAW	1000	"	**SHOSHONE W**	900
"	SIMPLOT	1000	"	HWY26 MP16	150
1995	Total: 15 Fires For	4,322 ac	"	GOODTIME 1	200
1996	OWINZA #1	1	"	**GOODTIME 2**	200
"	OWINZA #2	1	"	OWINZA	2
"	**US93 MP67**	1	"	OWINZA 2	1
"	INSULATOR	10	"	OWINZA 3	1
"	STAR LAKE	500	"	SID CROSSING	8
"	**RICHFIELD**	35000	"	SID CROSSING 2	1
"	TUNUPA	10	"	MALLARD LAKE	30000
"	BURMAH	100	"	HWY93 MP19	5
"	**JOHNNYS MI**	50	"	**UPRR MP318**	40
"	**JOHNNYS E**	10	"	**BESSLEN 1**	10
"	**JOHNNYS W**	10	"	**BESSLEN 2**	20
"	STAR LAKE	300	"	HWY24 MP48	20
"	5426 MP155	10	"	BURMA HRD	150
"	MAMMOTH 2	100	"	UPRR MP3055	1
"	THORN CREEK	10	"	**UPRR MM303**	15
"	KIMAMA XING	5	"	NEWYEAR LAKE	1000
"	**UPRR 294**	2	"	SENTER 1	1
"	CEPTER	200	"	SENTER 2	10
"	SENTER	1800	"	NORLAND 4N	500
"	FLATTOP RES.	500	"	KIMAMA 2	50
1996	Total: 20 Fires For	38,620ac	"	UPRR MP288	2
1997	PREACHER 1	1	"	SENTER 3	5
"	UPRR MP305	10	"	**HIDDEN VALLEY**	50
"	UPRR MP318	20	"	**HWY24 MP36**	1
"	**SEWAGE POND**	10	"	KIMAMA 1	1
"	**OWINZA**	10	1999	Total: 34 Fires For	34,267ac
"	HWY26 MP15	20	2000	**HWY75 MP93**	1
"	MILNER CANAL	5	"	**HWY75 MP93-2**	1
"	**HIDDEN VALLEY**	10	"	LITTLE DROP	30

YEAR	FIRE	ACRES	YEAR	FIRE	ACRES
2000	**HIDDEN VALLEY**	100	2002	**4N SHOSHONE**	20
“	BUCKLAKE	1	"	UPRR 318	1
“	TUNUPA	1	“	MAGIC	30
“	**STAGEBARN**	107245	“	**HWY75 MM83**	1
“	**WILSON SE**	55000	“	**CRATER BUTTE**	3
“	UPRR MM290 5	10	“	**JIM BURNS**	52370
“	HWY24 MP44	1	“	MILNER 1	3
“	SID BUTTE	3500	“	MILNER 2	3
“	**HIDDEN VALLEY**	2000	“	SO DIETRICH	410
“	**SID BUTTE**	16664	“	CROSSING	10
2000	Total: 13 Fires For	18,4474ac	“	**HWY24 MM35**	30
2001	**DIETRICH**	2660	“	LAIDLAW S	50
“	HWY93 MP17	100	“	HWY24 MM46	860
“	DUMP	15	2002	Total: 20 Fires For	326,954ac
“	TUNUPA	20	2003	HWY75 MM85	1
“	**DIETRICH**	164685	“	UPRR MM31	10
“	HWY93 MP17	1	“	UPRR MM31	1
“	**SHOSHONE H**	50	“	UPRR MM30	30
“	2 SO MAMMOTH	50	“	UPRR MM30	1
“	HWY93 MP58	5	“	HWY75 MM75	3
“	**LITTLE DROP**	50	“	**HWY26 MM15**	2000
“	THEELUSIV	2	“	**3N SHOSHONE**	30
“	BUCKLAKE	1	“	HWY75 MM76	300
“	**DIETRICH BUTTE**	20	“	**SHOSHONE WSA**	3
“	DYNAMITE	50	“	**HWY75 MM76W**	1
“	HWY75 MP76	1	“	S KIMAMA	20
“	**SHO SHONE ASST1**	1	“	RURERT ASST 14	300
“	HIDDEN VALLEY	20	“	THE CRATER	270
“	**THE LEDGE**	10	“	ID POWER	1
“	HWY75 MM81	5	“	**SID BUTTE**	26800
“	SID SEC 28	465	2003	Total: 17 Fires For	29,781ac
“	KIMAMA XIN	20	2004	BLACK BUTTE	1
“	SHALE BUTTE	800	“	DROPS	1
“	BLACK RIDGE	100	7/2004	Total: 2 Fires For	2ac
“	KIMAMA BUTTE	50			
“	**HWY24 MP33**	5			
“	**UPRR MM294**	2			
2001	Total: 27 Fires For	169,188ac			
2002	UPRR MM32	3			
“	**THORN CREEK**	20			
“	**SO DIETRICH**	410			
“	**OWINZA**	181520			
“	MALLARD LAKE	18200			
“	**SHOSHONE**	56200			
“	**SHOSHONE**	120			
“	MAMMOTH CAVE	16710			

Narrative: Table 4: fire history displays the number of wildfires Lincoln County has endured over the past ten (10) years. Over two thirds (2/3) of Lincoln County has burned during this time period. Of particular interest is the wildfire frequency and, number of incidents related to the Lincoln County’s heavily traveled corridor. Roadside starts (32) and railroad fires (38) represent

41% of all wildfire incidents over the past ten (10) years. Individual highlighted incidents represent the number of wildfires Lincoln County FPD's responded to through existing mutual aid agreements.

2.7 Fuel Models:

Fuel Models three (3) and five (5) are predominant throughout Lincoln County. (Figure 2) This is due to past disturbance and a change in land use practices. Under pristine conditions Lincoln County's predominant fuel model would be models five (5) and six (6) comprised of native grasses, forbs, and brush. A brief description of each model follows:

> **Fuel Model 3** (2.5 feet deep) Fires in this fuel are the most intense of the grass group and display high rates of spread under the influence of wind. Stands are tall, averaging about 3 feet, but considerable variation may occur. Approximately one-third or more of the stands are considered dead or cured and maintain the fire.
>
> **Fuel Model 5** (2 feet deep) Fire is generally carried in the surface fuels made up of litter cast by the shrubs and the grasses or forbs in the understory. Fires are generally not very intense as surface fuel loads are light, the shrubs are young with little dead material, and the foliage contains little volatile material. Shrubs are generally not tall, but nearly cover the entire area. Young, green stands with little or no deadwood. <u>As the shrub fuel moisture drops, consider using a Fuel Model 6.</u>

Figure 2 Fire History